Index to Volume XVII., Second Series

A.

Abbott. R. B., Damped Electric Oscillations, 482.
Damped Electrical Oscillations, 510.
Absorber, Mass-Absorption Coefficients as a Function of Wave-Length above and below the K X-Ray Limit of the Absorber, *F. K. Richtmyer*, 264.
Absorption, The, of Gamma Rays by Magnetized Iron, *A. H. Compton*, 38.
Absorption, On the, of X-Rays by Chromium, Manganese and Iron, *William Duane and Hugo Fricke*, 529.
Absorption of Light, The, by Mixtures of Inorganic Salts, *E. G. George*, 435.
Absorption Spectra, The, of Ortho-Cresolsulphonphthalein, *W. R. Orndorff, R. C. Gibbs, M. Scott and S. D. Jackson*, 437.
Absorption Spectrum, On the, of HCl, *Walter F. Colby and Charles F. Meyer*, 268.
Absorption, Transmission and, of Sound by a Porous Material, *Paul E. Sabine*, 378.
Acoustics, The, of Large Auditoriums, *C. R. Fountain*, 385.
Acoustical Double Resonator, The, and its Applications, *F. R. Watson*, 380.
Adsorbed Air, The Effect of, on the Ageing of Thin Metal Films, *Lewis R. Koller*, 230.
Ageing, The Effect of Adsorbed Air on the, of Thin Metal Films, *Lewis R. Koller*, 231.
Alloys, X-Ray Analysis of Three Series of, *Mary R. Andrews*, 259.
Alpha Rays, Multiple Valency in the Ionization by, *T. R. Wilkins*, 404.
Alternating Current Permeability, The Effect of a Superposed Constant Field upon the, and Energy Loss in Iron, *Alva W. Smith*, 416.
Aluminum, The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave-Length between 0.13 and 1.05 Angstrom Units in Water, Lithium, Carbon, Nitrogen, Oxygen, and Iron, *C. W. Hewlett*, 284.
American Physical Society:
Abstracts, 230, 371, 508, 521.
Minutes, 228, 367, 508, 519.
Amplification Constant, Calculation of the, of the Weagant Thermionic Vacuum Tube, *Alexander Marcus*, 1.
Analyzer, A Strained Glass Elliptic Polarizer and, *A. DeForest Palmer*, 409.
Anderson, Evald, Nature of Ionization in the Point to Plate Discharge, 516.
Andrews, Mary R., X-Ray Analysis of Three Series of Alloys, 259.
Angle of Incidence, The Effect of, on the Reflection and Secondary Emission of Slow Moving Electrons from Platinum, *John T. Tate*, 394.
Anhysteretic Curves of Iron-Carbon Alloys made with a Braun Tube, *C. W. Waggoner and F. A. Molby*, 427.
Astronomical Measurements, On the Application of Interference Methods to, *A. A. Michelson*, 405.
Atmospheric Electricity. Vertical Electric Currents and the Relation between Terrestrial Magnetism and, *Louis A. Bauer*, 424.
Atom, The Structure of the Helium, *Irving Langmuir*, 339.
Atom, The Stability of the, as Related to Nuclear Composition, *William D. Harkins*, 386.
Atomic Model, A Copernican, Based on Electromagnetic Theory, *Albert C. Crehore*, 541.
Atomic Species, The Abundance of, as Related to Rutherford's Theory of Nuclear Structure, *William D. Harkins*, 388.
Audion Bulbs, Photoelectric Phenomena in Coated Filament, *Ernest Merritt*, 525.
Auditoriums, The Acoustics of Large, *C. R. Fountain*, 385.

B.

Baker, W. C., Effect of Strong Electrostatic Fields on the Vaporization of Tungsten, 239.
Balmer Series, The, of Hydrogen, and the Quantum Theory of Line Spectra, *Raymond T. Birge*, 508.
Balmer Series, The, of Hydrogen and the Quantum Theory of Line Spectra, *Raymond T. Birge*, 589.
Barber, I. Garnett, Secondary Electron Emission from Copper Surfaces, 322.
Secondary Electron Emission from Copper Surfaces, 393.
Barium, New Strontium and, Photo-electric Cells, *Theodore W. Case*, 398.
Barnett, L. J. H., Additional Experiments on the Nature of the Magnetic Molecule, 404.

Barnett, S. J., Additional Experiments on the Nature of the Magnetic Molecule, 404.
Bateman, H., Electricity and Gravitation, 64.
The Lines of Electric Force of a System of Electric Poles Moving along the Same Straight Line, 414.
Bauer, Louis A., Vertical Electric Currents and the Relation between Terrestrial Magnetism and Atmospheric Electricity, 424.
The Eclipse Magnetic Systems of May 29, 1919, 426.
Bayley, P. L., Some Applications of the Method of Images, I., 147.
Binaural Location, The, of Pure Tones, *Thornton G. Fry*, 532.
Birge, Raymond T., The Balmer Series of Hydrogen, and the Quantum Theory of Line Spectra, 508.
The Balmer Series of Hydrogen and the Quantum Theory of Line Spectra, 589.
Bismuth, Magneto-Resistance Effects in Films of, *L. F. Curtiss*, 235.
Blackening, The, of a Photographic Plate as a Function of Intensity of Light and Time of Exposure, *P. S. Helmick*, 135.
Bowen, I. S., The Magnetic Mechanical Analysis of Manganese Steel, 237.
Brant, Laura S., Magnetic Susceptibility of Nickel and Cobalt Chloride Solutions, 678.
Braun Tube, Anhysteretic Curves of Iron-Carbon Alloys made with a, *C. W. Waggoner and F. A. Molby*, 427.
Breakdown Voltage, Conductivity of Insulating Materials near the, *James E. Shrader*, 234.
Breakdown Voltage, Conductivity of Insulating Materials near the, *J. E. Shrader*, 491.
Breit, G., The Distributed Capacity of Inductance Coils, 649.
Bridgman, P. W., The Electrical Resistance of Metals, 161.
A Theory of the Electrical Resistance of Metals, 421.
Brown, Ben E., The Occlusion of Water by Gas-mask Charcoal, 700.
Brown, J. G., A Wave Composition Model, 512.
Brown, S. L., Diathermancy of Ice, Water and Steam, 375.
Bumstead, H. A., 227.

C.

Cady, W. G., The Piezo-Electric Resonator, 531.
Cajori, Florian, Note on the Fahrenheit Scale, 516.
Calcite, The Reflection of X-Rays from, *Bergen Davis and W. M. Stempel*, 526.
Calcite, An Experimental Study of the Reflection of X-Rays from, *Bergen Davis and W. M. Stempel*, 608.
Calcium, The Crystal Structure of, *A. W. Hull*, 42.
Calcium Arc, Pressure Shifts in a, *Henry G. Gale and L. F. Miller*, 428.
Calcium Arc, Some Additional Measurements of Wave-Lengths in the, in Vacuo, *Geo. V. McCauley*, 430.
Capacity, The Distributed, of Inductance Coils, *G. Breit*, 649.
Capillary Flow, The Dynamics of, *Edward W. Washburn*, 273.
Capillary Flow, The Dynamics of, *Edward W. Washburn*, 374.
Capacity, Polarization, and Polarization Resistance as Dependent upon Frequency, *Ernest Merritt*, 524.
Carbon, The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave-Length between 0.13 and 1.05 Angstrom Units in Water, Lithium, Nitrogen, Oxygen, Aluminum, and Iron, *C. W. Hewlett*, 284.
Carbon Dioxide, On the Motion of a Sphere of Oil through, and an Exact Determination of the Coefficient of Viscosity of that Gas by the Oil Drop Method, *L. J. LaSalle*, 354.
Carson, John R., Theory and Calculation of Variable Electrical Systems, 116.
Case, Theodore W., New Strontium and Barium Photo-electric Cells, 398.
Carter, Edna, Character of the Spectra Produced by High Potential Sparks in a Vacuum, 436.
Cathode Ray Oscillograph, A Low Voltage, *J. B. Johnson*, 420.
Cathode Region, Tube Experiments, with the, in a Transverse Magnetic Field, *L. Thompson*, 421.
Charcoal, The Occlusion of Water by Gas-mask, *Ben. E. Brown*, 700.
Child, Clement D., A Continuous Spectrum from Mercury Vapor, 270.
Chromium, On the Absorption of X-Rays by, Manganese and Iron, *William Duane and Hugo Fricke*, 529.
Clark, Harry, A Method of Measuring Surface Tension of Liquids, 537.
Coaxial Cylinders, The Motion of Electrons between, in a Uniform Magnetic Field, *Albert W. Hull*, 539.
Cobalt Chloride Solutions, Magnetic Susceptibility of Nickel and, *Laura S. Brant*, 678.
Coblentz, W. W., The Spectrophotoelectric Sensitivity of Proustite, 245.
Coefficient of Viscosity, On the Motion of a Sphere of Oil through Carbon Dioxide and an Exact Determination of the, of that Gas by the Oil Drop Method, *L. J. LaSalle*, 354.
Colby, Walter F., On the Absorption Spectrum of HCl, 268.
Collisions, Inelastic, of Electrons in Vapors of Certain Compound Molecules, *Paul D. Foote and F. L. Mohler*, 394.

Color Filters for Photographic Uses, *Charles D. Hodgman*, 246.
Compensation Scheme, A, for Electrostatic Measurements, *W. F. G. Swann*, 240.
Compound Molecules, Inelastic Collisions of Electrons in Vapor of Certain, *Paul D. Foote and F. L. Mohler*, 394.
Compton, A. H., The Absorption of Gamma Rays by Magnetized Iron, 38.
Compton, K. T., Note on the Radiating and Ionizing Potentials of Hydrogen, 45.
Conductivity of Insulating Materials near the Breakdown Voltage, *James E. Shrader*, 234.
Conductivity of Insulating Materials near the Breakdown Voltage, *J. E. Shrader*, 491.
Cooling, The Effect of, on a Cement Pier, *Ernest A. Hodgson*, 376.
Copernican Atom, The, Radiating Energy. A Physical Interpretation of Plank's Quantum Rule, *Albert C. Crehore*, 544.
Copernican Atomic Model, A, Based on Electromagnetic Theory, *Albert C. Crehore*, 541.
Copper Surfaces. Secondary Electron Emission from, *I. Garnett Barber*, 322.
Copper Surfaces, Secondary Electron Emission from, *I. Garnett Barber*, 393.
Crehore, Albert C., Comparison between the Fundamental Equations for the Ponderomotive Force for Point Charges due to Larmor-Lorentz and to Megh Nad Saha, 249.
The Newtonian Laws of Gravitation Deduced from the Saha Electromagnetic Theory Applied to the Copernican Atom, 249.
A Copernican Atomic Model Based on Electromagnetic Theory, 541.
The Copernican Atom Radiating Energy, A Physical Interpretation of Planck's Quantum Rule, 544.
Crystals, Reflection of X-Rays from, *W. M. Stempel*, 521.
Crystal Reflection, The Concentration of Monochromatic X-Rays by, *Elmer Dershem and C. T. Dozier*, 519.
Crystal Structure, The, of Ice, *D. M. Dennison*, 20.
Crystal Structure, The, of Calcium, *A. W. Hull*, 42.
Crystal Structure, Graphical Determination of Hexagonal and Tetragonal, from X-Ray Data, *Albert W. Hull and Wheeler P. Davey*, 266.
Crystal Structure, The, of Two Rare Halogen Salts, *Wheeler P. Davey and Frances G. Wick*, 403.
Crystal Structure, The Optical Dispersion and the, of Rock Salt and Sylvite, *H. H. Marvin*, 412.
Crystal Structure, Graphical Determination of Hexagonal and Tetragonal, from X-Ray Data, *Albert W. Hull and Wheeler P. Davey*, 549.
Curtiss, L. F., Magneto-Resistance Effects in Films of Bismuth, 235.

D.

Damped Electric Oscillations, *R. B. Abbott*, 482.
Davey, Wheeler P., Graphical Determination of Hexagonal and Tetragonal Crystal Structure from X-Ray Data, 266.
The Crystal Structure of Two Rare Halogen Salts, 403.
The Cubic Shapes of Certain Ions, as Confirmed by X-Ray Crystal Analysis, 402.
Graphical Determination of Hexagonal and Tetragonal Crystal Structure from X-Ray Data, 549.
Davis, Bergen, The Reflection of X-Rays from Calcite, 526.
An Experimental Study of the Reflection of X-Rays from Calcite, 608.
Davisson, C., The Relation between the Emissive Power of a Metal and its Electrical Resistivity, 261.
Dempster, A. J., Positive Ray Analysis of Magnetism, 427.
Dennison, D. M., The Crystal Structure of Ice, 20.
Density, Influence of the Earth's Potential Gradient upon the Measurement of the Atmospheric Ionic, by the Ebert Ion Counter, *J. F. Mackell*, 390.
Dershem, Elmer, The Concentration of Monochromatic X-Rays by Crystal Reflection, 519.
Differential Thermo-couple, The use of the, in Melting Point Determinations, *O. H. Gish*, 377.
Diurnal Variations in Terrestrial Magnetism and in the Electrical Potential of the Earth, *Fernando Sanford*, 513.
Dodd, L. E., Note on Sheet Striæ as Thin Films in Optical Glass, 270.
Downey, K. Melvina, The Variation of the Residual Ionization in Air with Pressure, 389.
Dozier, C. T., The Concentration of Monochromatic X-Rays by Crystal Reflection, 519.
An Explanation of X-Ray Diffraction Patterns from Rolled Metals, 519.
Duane, William, On the Relative Positions of Lines in X-Ray Spectra, 259.
Approximate Computations of X-Ray Absorption Frequencies, 431.
On the Absorption of X-Rays by Chromium, Manganese and Iron, 529.
Duncan, Jr., R. D., Stability Conditions in Vacuum Tube Circuits, 302.
Dynamics, The, of Capillary Flow, *Edward W. Washburn*, 374.
Dynamic Characteristics, The, of Three Electrode Vacuum Tubes, *John G. Frayne*, 391.

E.

Ebert Ion Counter. Influence of the Earth's Potential Gradient upon the Measure-

ment of the Atmospheric Ionic Density by the Ebert Ion Counter, *J. F. Mackell*, 390.

Eclipse Magnetic Systems, The, of May 29, 1919, *Louis A. Bauer*, 426.

Eckhardt, E. A., A Portable Sound Producer of Considerable Range as to Frequency and Intensity, 380.

The Sound Field of a Parabolic Mirror, 381.

Electron Tube Drive for Tuning Forks, 535.

A High Speed Oscillograph Camera, 536.

Eldridge, A. G., Moving Pictures of Wave Motion, 381.

Electric Arc, The Luminescence of Certain Oxides sublimed in the, *E. L. Nichols and D. T. Wilber*, 707.

Electrostatic Charges, The, of the Earth and Sun and their Relation to Terrestrial Magnetism, *Fernando Sanford*, 243.

Electric Force, The Lines of, of a System of Electric Poles Moving along the Same Straight Line, *H. Bateman*, 414.

Electrical Doublet Theory, An, of the Nature of the Molecular Forces of Chemical and Physical Interaction, *R. D. Kleeman*, 540.

Electrical Resistance, The, of Metals, *P. W. Bridgman*, 161.

Electrical Resistance, A Theory of the, of Metals, *P. W. Bridgman*, 421.

Electrical Systems, Theory and Calculation of Variable, *John R. Carson*, 116.

Electricity and Gravitation, *H. Bateman*, 64.

Electrolytic Cell, The Current from the Photo-active, *C. C. Murdock*, 626, 718.

Electrostatic Fields, Effect of Strong, on the Vaporization of Tungsten, *A. G. Worthing and W. C. Baker*, 239.

Electrostatic Fields, Effect of Strong, on the Vaporization of Tungsten, II., *A. G. Worthing*, 418.

Electrostatic Measurements, A Compensation Scheme for, *W. F. G. Swann*, 240.

Electric Motor, A Thermo, *Paul Kirkpatrick*, 511.

Electrical Oscillations, Damped, *R. B. Abbott*, 510.

Electric Poles, The Lines of Electric Force of a System of, Moving along the same Straight line, *H. Bateman*, 414.

Electrical Potential, Diurnal Variations in Terrestrial Magnetism and in the, of the Earth, *Fernando Sanford*, 513.

Electrical Resistivity, The Relation between the Emissive Power of a Metal and its, *C. Davisson and J. R. Weeks*, 261.

Electrons, Inelastic Collisions of, in Vapors of Certain Compound Molecules, *F. L. Mohler*, 394.

Electrons, The Effect of Angle of Incidence on the Reflection and Secondary Emission of Slow Moving, from Platinum, *John T. Tate*, 394.

Electrons, The Motion of, between Coaxial Cylinders in a Uniform Magnetic Field, *Albert W. Hull*, 539.

Electron Emission, Secondary, from Copper Surfaces, *I. Garnett Barber*, 322.

Electron Emission, Secondary, from Copper Surfaces, *I. Garnett Barber*, 393.

Electron Tube Drive for Tuning Forks, *E. A. Eckhardt, J. C. Karcher and M. Keiser*, 535.

Electromagnetic Induction, Note on, and Relative Motion: A Rejoinder, *W. F. G. Swann*, 242.

Electromagnetic Induction, An Experiment on, and Relative Motion, *W. F. G. Swann*, 423.

Electromagnetic Theory, An, of Gravitation, *H. A. Wilson*, 54.

Electro-Magnetic Theory, The Newtonian Laws of Gravitation Deduced from the Saha, Applied to the Copernican Atom, *Albert C. Crehore*, 252.

Electromagnetic Theory, A Copernican Atomic Model Based on, *Albert C. Crehore*, 541.

Electromotive Forces, A Means of Distinguishing between Intrinsic and Spurious Contact, *R. A. Millikan*, 399.

Elliptic Polarizer, A Strained Glass, and Analyzer, *A. DeForest Palmer*, 409.

Emissive Power of a Metal, The Relation between the, and its Electrical Resistivity, *C. Davisson and J. R. Weeks*, 261.

Emission, The Effect of Angle of Incidence on the Reflection and Secondary, of Slow Moving Electrons from Platinum, *John T. Tate*, 394.

Energy Distribution, Some Peculiarities in, by Speculum Gratings, *L. R. Ingersoll*, 407.

Energy Distribution, Some Peculiarities of Polarization and, by Speculum Gratings, *L. R. Ingersoll*, 491.

Energy Loss, The Effect of a Superposed Constant Field upon the Alternating Current Permeability and, in Iron, *Alva W. Smith*, 416.

Energy Losses in Commercial Hammers, *Edwin Morrison and Robert L. Petry*, 373.

Erikson, Henry A., Size and Aging of Ions Produced in Air, 400.

Errors, A Study of the, Involved in Solving for the Constants of the Fourier's Series by a Calculation Method, *Warren Mason*, 315.

Exposure. The Blackening of a Photographic Plate as a Function of Intensity of Light and Time of, *P. S. Helmick*, 135.

F.

Fahrenheit Scale, Note on the, *Florian Cajori*, 516.

Fant, A. T., The Intensity of Light Transmitted through a deep Slit, 413.
Flame Excitation of Luminescence, *E. L. Nichols and D. T. Wilber*, 269.
Flame Excitation of Luminescence, 453.
Fluid, The Resistance of a Compressible, at High Velocities, *L. Thompson*, 371.
Foote, Paul D., Inelastic Collisions of Electrons in Vapors of Certain Compound Molecules, 394.
Forsythe, W. E., The Current-Temperature Relation for different Pyrometer Filaments, 267.
Found, C. G., Studies with the Ionization Gauge, I., Construction and Method of Calibration, 7.
Fountain, C. R., The Acoustics of Large Auditoriums, 385.
Fourier's Series, A Study of the Errors Involved in Solving for the Constants of, by a Calculation Method, *Warren Mason*, 315.
Franz, F. W., Minimum Sound Energy for Audition, 384.
Frayne, John G., The Dynamic Characteristics of Three Electrode Vacuum Tubes, 391.
A High Frequency Resistance Standard, 415.
Frequency, Polarization Capacity and Polarization Resistance as Dependent upon, *Ernest Merritt*, 524.
Fricke, Hugo, The Spectrum of Helium in the Extreme Ultra-Violet, 434.
On the Absorption of X-Rays by Chromium, Manganese and Iron, 529.
Fry, Thornton C., The Thermionic Current between Parallel Plane Electrodes; Velocities of Emission Distributed according to Maxwell's Law, 441.
The Binaural Location of Pure Tones, 532.

G.

Gale, Henry G., Pressure Shifts in a Calcium Arc, 428.
Gamma Rays, The Absorption of, by Magnetized Iron, *A. H. Compton*, 38.
Gas-mask Charcoal, The Occlusion of Water by, *Ben. E. Brown*, 700.
George E. F., The Absorption of Light by Mixtures of Inorganic Salts, 435.
Gibbs, R. C., The Absorption Spectra of Ortho-Cresolsulphonphthalein, 437.
Gish, O. H., The Use of the Differential Thermo-couple in Melting Point Determinations, 377.
Glass, The Coloration of, by Ultra-violet Light, *J. B. Nathanson*, 408.
Gratings, Some Peculiarities of Polarization and Energy Distribution by Speculum, *L. R. Ingersoll*, 491.
Gravitation, An Electromagnetic Theory of, *H. A. Wilson*, 54.
Gravitation, Electricity and, *H. Bateman*, 64.
Gravitation, The Newtonian Laws of, Deduced from the Saha Electro-magnetic Theory Applied to the Copernican Atom, *Albert C. Crehore*, 252.
Grondahl, L. O., A Method of Studying Sound Waves by Means of a Synchronous Commutator, 258.

H.

Hadfield, Robert, The Magnetic Mechanical Analysis of Manganese Steel, 237.
Hall Coefficient, Constancy of, in Thin Silver Films, *G. W. Stewart*, 232.
Hall Effect, The, and the Nernst Effect in Magnetic Alloys, *Alpheus W. Smith*, 23.
Hall Effect, The, and the Specific Resistance in Silver Films, *G. R. Wait*, 233.
Hall Effect, The, and the Nernst Effect in Magnetic Alloys, *Alpheus W. Smith*, 233.
Halogen Salts, The Crystal Structure of Two Rare, *Wheeler P. Davey and Frances G. Wick*, 403.
Hammers, Energy Losses in Commercial, *Edwin Morrison and Robert L. Petry*, 373.
Harkins, W. D., The Separation of Isotopes, 386.
The Stability of the Atom as Related to Nuclear Composition, 386.
The Abundance of Atomic Species as Related to Rutherford's Theory of Nuclear Structure, 388.
Hartley, R. V. L., The Binaural Location of Pure Tones, 532.
Hebbert, C. M., Some Applications of the Method of Images, II., 157.
Helium Atom, The Structure of the, *Irving Langmuir*, 339.
Helium Atom, The Structures of the, and the Hydrogen Molecule, *Irving Langmuir*, 401.
Helium, The Spectrum of, in the Extreme Ultra-Violet, *Hugo Fricke and Theodore Lyman*, 434.
Helmick, P. S., The Blackening of a Photographic Plate as a Function of Intensity of Light and Time of Exposure, 135.
The Blackening of a Photographic Plate as a Function of Intensity of Light and Time of Exposure, 411.
Hewlett, C. W., A New Tone Generator, 257.
The Absorption and Scattering Coefficients for Homogeneous X-Rays in Several Elements of Low Atomic Weight, 267.
The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave Length between 0.13 and 1.05 Angstrom Units in Water, Lithium, Carbon, Nitrogen, Oxygen, Aluminum, and Iron, 284.
Hexagonal Crystals, A Determination of

Young's Modulus and of the Coefficient of Simple Rigidity of Natural, of Selenium, *L. P. Sieg and R. F. Miller*, 411.
Hidnert, Peter, The Thermal Expansion of Nickel, Monel Metal, Stellite and Stainless Steel, 372.
High Potential Sparks, Character of the Spectra Produced by, in a Vacuum, *Edna Carter*, 436.
Hodgman, Charles D., Color Filters for Photographic Uses, 246.
Hodgson, Ernest A., The Effect of Cooling on a Cement Pier, 376.
Homogeneous X-Rays, The Absorption and Scattering Coefficients for, in Several Elements of Low Atomic Weight, *C. W. Hewlett*, 267.
Homogeneous X-Rays, The Mass Absorption and Mass Scattering Coefficients for, Homogeneous of Wave-Length between 0.13 and 1.05 Angstrom Units in Water, Lithium, Carbon, Nitrogen, Oxygen, Aluminum, and Iron, *C. W. Hewlett*, 284.
Howes, Horace L., The Luminescence of Samarium, 60.
The Spectral Structure of the Luminescence Excited by the Hydrogen Flame, 469.
The Spectral Structure of the Luminescence Excited by the Hydrogen Flame, 538.
Hull, A. W., The Crystal Structure of Calcium, 42.
Graphical Determination of Hexagonal and Tetragonal Crystal Structure from X-Ray Data, 266.
The Motion of Electrons between Coaxial Cylinders in a Uniform Magnetic Field, 539.
Graphical Determination of Hexagonal and Tetragonal Crystal Structure from X-Ray Data, 549.
X-Ray Crystal Analysis of Thirteen Common Metals, 571.
Humidity, Effect of, on Sound Absorption by Plaster Walls, *Paul E. Sabine*, 379.
Hydrogen, Note on the Radiating and Ionizing Potentials of, *K. T. Compton and P. S. Olmstead*, 45.
Hydrogen, The Balmer Series of, and the Quantum Theory of Line Spectra, *Raymond T. Birge*, 508.
Hydrogen, The Balmer Series of, and the Quantum Theory of Line Spectra, *Raymond T. Birge*, 589.
Hydrogen Chloride, On the Absorption Spectrum of, *Walter F. Colby and Charles F. Meyer*, 268.
Hydrogen Flame, The Spectral Structure of the Luminescence Excited by the, *Horace L. Howes*, 469.
Hydrogen Flame, The Spectral Structure of the Luminescence Excited by the, *Horace L. Howes*, 538.
Hydrogen Molecule, The Structures of the Helium Atom and the, *Irving Langmuir*, 401.

I.

Ice, Diathermancy of, Water and Steam, *S. L. Brown*, 375.
Ice, The Crystal Structure of, *D. M. Dennison*, 20.
Images, Some Applications of the Method of, I., *Jacob Kunz and P. L. Bayley*, 147.
Images, Some Applications of the Method of, II., *C. M. Hebbert*, 157.
Inductance Coils, The Distributed Capacity of, *G. Breit*, 649.
Infra-red Spectra of Isotopes, *F. W. Loomis*, 436.
Ingersoll, L. R., Some Peculiarities in Energy Distribution by Speculum Gratings, 407.
Some Peculiarities of Polarization and Energy Distribution by Speculum Gratings, 491.
Index, 719.
Inorganic Salts, The Absorption of Light by Mixtures of, *E. G. George*, 435.
Insulating Materials, Conductivity of, near the Breakdown Voltage, *James E. Shrader*, 234.
Insulating Materials, Conductivity of, near the Breakdown Voltage, *J. E. Shrader*, 491.
Intensity of Light, The Blackening of a Photographic Plate as a Function of, and Time of Exposure, *P. S. Helmick* 135.
Intensity of Light, The Blackening of a Photographic Plate as a Function of, and Time of Exposure, *P. S. Helmick*, 411.
Intensity of Light, The, Transmitted through a Deep Slit, *L. P. Sieg and A. T. Fant*, 413.
Interference Methods, On the Application of, to Astronomical Measurements, *A. A. Michelson*, 405.
Ions, Size and Aging of, Produced in Air, *Henry A. Erikson*, 400.
Ions, The Cubic Shapes of Certain, as Confirmed by X-Ray Crystal Analysis, *Wheeler P. Davey*, 402.
Ions, The Formation of Negative, in Air, *Leonard B. Loeb*, 89.
Ionization, Multiple Valency in the, by Alpha Rays, *T. R. Wilkins*, 404.
Ionization, Nature of, in the Point to Plate Discharge, *Evald Anderson*, 516.
Ionization Gauge, Studies with the, I. Construction and Method of Calibration, *S. Dushman and C. G. Found*, 7.
Ionizing Potentials, Note on the Radiating and, of Hydrogen, *K. T. Compton and P. S. Olmstead*, 45.
Isotopes, The Separation of, *R. S. Millikan*, 386.
Isotopes, Infra-red Spectra of, *F. W. Loomis*, 436.

Iron, The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave-Length between 0.13 and 1.05 Angstrom Units in Water, Lithium, Carbon, Nitrogen, Oxygen, Aluminum and, *C. W. Hewlett*, 284.

Iron: The Effect of a Superposed Constant Field upon the Alternating Current Permeability and Energy Loss in, *Alva W. Smith*, 416.

Iron, On the Absorption of X-Rays by Chromium, Manganese and, *William Duane and Hugo Fricke*, 529.

Iron-Carbon Alloys, Anhysteretic Curves of, made with a Braun Tube, *C. W. Waggoner and F. A. Molby*, 427.

J.

"J" Radiation, The Evidence Regarding the So-called, in the Characteristic X-Ray Spectra of the Elements, *F. K. Richtmyer*, 433.

Jackson, S. D., The Absorption Spectra of Ortho-Cresolsulphonphthalein, 437.

Johnson, J. B., A Low Voltage Cathode Ray Oscillograph, 420.

K.

K X-Ray Limit, Mass-Absorption Coefficients as a Function of Wave-Length above and below the, of the Absorber, *F. K. Richtmyer*, 264.

Kahler, H., The Crystalline Structure of Sputtered Metallic Films, 230.

Karcher, J. C., Apparatus for Measuring Sound Intensity, 382.

A Method of Measuring Phase Differences in a Sound Field, 382.

Electron Tube Drive for Tuning Forks, 535.

Keiser, M., Electron Tube Drive for Tuning Forks, 535.

Kirkpatrick, Paul, A Thermo Electric Motor, 511.

Kleeman, R. D., An Electrical Doublet Theory of the Nature of the Molecular Forces of Chemical and Physical Interaction, 540.

Knipp, Charles T., Note on the Characteristics of the New Singing Tube, 532.

Koller, Lewis R., The Effect of Adsorbed Air on the Ageing of Thin Metal Films, 230.

Koppius, Otto, A Comparison of the Thermionic and Photoelectric Work Function from Platinum, 395.

Kunz, Jacob, Some Applications of the Method of Images, I., 147.

Kurth, E. H., Soft X-Rays of Characteristic Type, 528.

L.

Lamson, K. W., Reflection of Radiation from an Infinite Series of Equally Spaced Planes, 624.

Langmuir, Irving, The Structure of the Helium Atom, 339.

The Structures of the Helium Atom and the Hydrogen Molecule, 401.

Larmor-Lorentz, Comparison between the Fundamental Equations for the Ponderomotive Force for Point Charges due to, and to Megh Nad Saha, *Albert C. Crehore*, 249.

Lassalle, L. J., On the Motion of a Sphere of Oil through Carbon Dioxide and an Exact Determination of the Coefficient of Viscosity of that Gas by the Oil Drop Method, 354.

Lecture Room Wall Charts, *F. J. Rogers*, 509.

Line Spectra, The Balmer Series of Hydrogen, and the Quantum Theory of, *Raymond T. Birge*, 508.

Lithium, The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave-Length between 0.13 and 1.05 Angstrom Units in Water, Carbon, Nitrogen, Aluminum, and Iron, *C. W. Hewlett*, 284.

Loeb, Leonard B., The Formation of Negative Ions in Air, 89.

The Formation of Negative Ions in Air, 400.

Loomis F. W., Infra-red Spectra of Isotopes, 436.

Luminescence, The, of Samarium, *Horace L. Howes*, 60.

Luminescence, Flame Excitation of, *E. L. Nichols and D. T. Wilber*, 269.

Luminescence, The, of Zinc Oxide above the Red Heat, *E. L. Nichols*, 429.

Luminescence, Flame Excitation of, *E. L. Nichols and D. T. Wilber*, 453.

Luminescence, The Spectral Structure of the, Excited by the Hydrogen Flame, *Horace L. Howes*, 469.

Luminescence, The Spectral Structure of the, Excited by the Hydrogen Flame, *Horace L. Howes*, 538.

Luminescence, The, of Certain Oxides sublimed in the Electric Arc, *E. L. Nichols and D. T. Wilber*, 707.

Luminosity, The, of Mercury Vapor Distilled from the Arc in Vacuo, *Norman H. Ricker*, 195.

Lyman, Theodore, The Spectrum of Helium in the Extreme Ultra-Violet, 434.

M.

McCauley, Geo. V., Some Additional Measurements of Wave-Lengths in the Calcium Arc in Vacuo, 430.

Mackell, J. F., Influence of the Earth's Potential Gradient upon the Measurement of the Atmospheric Ionic Density by the Ebert Ion Counter, 390.

Magnesium, Positive Ray Analysis of, *A. J. Dempster*, 427.

Magnetic Alloys, The Hall Effect and the Nernst Effect in, *Alpheus W. Smith*, 23.

Magnetic Alloys, The Hall Effect and the Nernst Effect in, *Alpheus W. Smith*, 233.
Magnetic Field, Tube Experiments, with the Cathode Region in a Transverse, *L. Thompson*, 421.
Magnetic Field, The Motion of Electrons between Coaxial Cylinders in a Uniform, *Albert W. Hull*, 539.
Magnetic Molecule, Additional Experiments on the Nature of the, *S. J. Barnett and L. J. H. Barnett*, 404.
Magnetic Susceptibility of Nickel and Cobalt Chloride Solutions, *Laura S. Brant*, 678.
Magnetized Iron, The Absorption of Gamma Rays by, *A. H. Compton*, 38.
Magneto-Resistance Effects in Films of Bismuth, *L. F. Curtiss*, 235.
Mainsprings of Watches, A Seasonal Breakage of the, *S. R. Williams*, 378.
Manganese, On the Absorption of X-Rays by Chromium, and Iron, *William Duane and Hugo Fricke*, 529.
Manganese Steel, The Magnetic Mechanical Analysis of, Robert Hadfield, *S. R. Williams and I. S. Bowen*, 237.
Marcus, Alexander, Calculation of the Amplification Constant of the Weagant Thermionic Vacuum Tube, 1.
Marvin, H. H., The Optical Dispersion and the Crystal Structure of Rock Salt and Sylvite, 412.
Mason, Warren, A Study of the Errors Involved in Solving for the Constants of Fourier's Series by a Calculation Method, 315.
Mass-Absorption Coefficients as a Function of Wave-Length above and Below the K X-Ray Limit of the Absorber, *F. K. Richtmyer*, 264.
Maxwell's Equations, The Absolute Significance of, *F. D. Murnaghan*, 73.
Measurements of Wave-Lengths, Some Additional, in the Calcium Arc in Vacuo, *Geo. V. McCauley*, 430.
Melting Point Determinations, The use of the Differential Thermo-couple in, *O. H. Gish*, 377.
Mercury Vapor, The Luminosity of, Distilled from the Arc in Vacuo, *Norman H. Ricker*, 195.
Mercury Vapor, A Continuous Spectrum from, *Clement D. Child*, 270.
Merritt, Ernest, Polarization Capacity and Polarization Resistance as Dependent upon Frequency, 524.
Photoelectric Phenomena in Coated Filament Audion Bulbs, 525.
Metals, X-Ray Crystal Analysis of Thirteen Common, *Albert W. Hull*, 571.
Metal Films, The Effect of Adsorbed Air on the Ageing of Thin, *Lewis R. Koller*, 231.
Metallic Films, The Crystalline Structure of Sputtered, *H. Kahler*, 230.
Metals, A Theory of the Electrical Resistance of, *P. W. Bridgman*, 421.
Metals, An Explanation of X-Ray Diffraction Patterns from, *C. T. Dozier*, 519.
Meyer, Charles F., On the Absorption Spectrum of HCl, 268.
Michelson, A. A., On the Application of Interference Methods to Astronomical Measurements, 405.
Miller, Dayton C., On the Propagation of the Sound Wave from the Muzzle of a Large Gun, 255.
Miller, L. F., Pressure Shifts in a Calcium Arc, 428.
Miller, R. F., A Determination of Young's Modulus and of the Coefficient of Simple Rigidity of Natural Hexagonal Crystals of Selenium, 411.
Millikan, R. A., A Means of Distinguishing between Intrinsic and Spurious Contact Electromotive Forces, 399.
Mohler, F. L., Inelastic Collisions of Electrons in Vapors of Certain Compound Molecules, 394.
Molby, F. A., Anhysteretic Curves of Iron-Carbon Alloys made with a Braun Tube, 427.
Molecular Forces, An Electrical Doublet Theory of the Nature of the, of Chemical and Physical Interaction, *R. D. Kleeman*, 540.
Monel Metal, The Thermal Expansion of Nickel, Stellite and Stainless Steel, *William Souder and Peter Hidnert*, 372.
Monochromatic X-Rays, The Concentration of, by Crystal Reflection, *Elmer Dershem and C. T. Dozier*, 519.
Morrison, Edwin, Energy Losses in Commercial Hammers, 373.
Multiple Valency in the Ionization by Alpha Rays, *T. R. Wilkins*, 404.
Murdock, C. C., The Current from the Photo-active Electrolytic, Cell, 626, 718.
Mulliken, R. S., The Separation of Isotopes, 386.
Murnaghan, F. D., The Absolute Significance of Maxwell's Equations, 73.

N.

Náthanson, J. B., The Coloration of Glass by Ultra-violet Light, 408.
Negative Ions, The Formation of, in Air, *Leonard B. Loeb*, 400.
Nernst Effect, The Hall Effect and the, in Magnetic Alloys, *Alpheus W. Smith*, 23.
Nernst Effect, The Hall Effect and the, in Magnetic Alloys, *Alpheus W. Smith*, 233.
New Books, 70, 272, 438, 648.
Newtonian Laws, The, of Gravitation deduced from the Saha Electro-magnetic Theory Applied to the Copernican Atom, *Albert C. Crehore*, 249.
Nitrogen, The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave-Length

between 0.13 and 1.05 Angstrom Units in Water, Lithium, Carbon, Oxygen, Aluminum, and Iron, *C. W. Hewlett*, 284.

Nichols, E. L., Flame Excitation of Luminescence, 269.

The Luminescence of Zinc Oxide above the Red Heat, 429.

Flame Excitation of Luminescence, 453.

The Luminescence of Certain Oxides sublimed in the Electric Arc, 707.

Nickel, The Thermal Expansion of, Monel Metal, Stellite and Stainless Steel, *William Souder and Peter Hidnert*, 372.

Nickel, Magnetic Susceptibility of, and Cobalt Chloride Solutions, *Laura S. Brant*, 678.

Nuclear Composition, The Stability of the Atom as Related to, *William D. Harkins*, 386.

Nuclear Structure: The Abundance of Atomic Species as Related to Rutherford's Theory of, *William D. Harkins*, 388.

O.

Occlusion of Water, The, by Gas-mask Charcoal, *Ben. E. Brown*, 700.

Oil Drop Method. On the Motion of a Sphere of Oil through Carbon Dioxide and an Exact Determination of the Coefficient of Viscosity of that Gas by the, *L. J. LaSalle*, 354.

Olmstead, P. S., Note on the Radiating and Ionizing Potentials of Hydrogen, 45.

Optical Dispersion, The, and the Crystal Structure of Rock Salt and Sylvite, *H. H. Marvin*, 412.

Optical Glass, Note on Sheet Striæ as Thin Films in, *L. E. Dodd*, 270.

Orndorff, W. R., The Absorption Spectra of Ortho-Cresolsulphonphthalein, 437.

Ortho-Cresolsulphonphthalein, The Absorption Spectra of, *W. R. Orndorff, R. C. Gibbs, M. Scott and S. D. Jackson*, 437.

Oscillations, Damped Electric, *R. B. Abbott*, 482.

Oscillograph Camera, A High Speed, *E. A. Eckhardt*, 536.

Oxides, The Luminescence of Certain, sublimed in the Electric Arc, *E. L. Nichols and D. T. Wilber*, 707.

Oxygen, The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave-Length between 0.13 and 1.05 Angstrom Units in Water, Lithium, Carbon, Nitrogen, Aluminum, and Iron, *C. W. Hewlett*, 284.

P.

Palmer, A. DeForest, A Strained Glass Elliptic Polarizer and Analyzer, 409.

Parabolic Mirror, The Sound Field of a, *E. A. Eckhardt*, 381.

Patterson, R. A., On the Relative Positions of Lines in X-Ray Spectra, 259.

Petry, Robert L., Energy Losses in Commercial Hammers, 373.

Phase Differences, A Method of Measuring, in a Sound Field, *J. C. Karcher*, 382.

Photo-active Electrolytic Cell, The Current from the, *C. C. Murdock*, 626, 718.

Photo-electric Cells, New Strontium and Barium, *Theodore W. Case*, 398.

Photoelectric Phenomena in Coated Filament Audion Bulbs, *Ernest Merritt*, 525.

Photoelectric Work Function, A Comparison of the Thermionic and from Platinum, *Otto Koppius*, 395.

Photographic Plate, The Blackening of a, as a Function of Intensity of Light and Time of Exposure, *P. S. Helmick*, 135.

Photographic Plate, The Blackening of a, as a Function of Intensity of Light and Time of Exposure, *P. S. Helmick*, 411.

Piezo-Electric Activity of Rochelle Salt under Various Conditions, *J. Valasek*, 422.

Piezo-Electric and Allied Phenomena in Rochelle Salt, *J. Valasek*, 475.

Piezo-Electric Resonator, The, *W. G. Cady*, 531.

Planck's Quantum Rule, A Physical Interpretation of, *Albert C. Crehore*, 544.

Plate Discharge, Nature of Ionization in the Point to, *Evald Anderson*, 516.

Platinum, The Effect of Angle of Incidence on the Reflection and Secondary Emission of Slow Moving Electrons from, *John T. Tate*, 394.

Platinum. A Comparison of the Thermionic and Photoelectric Work Function from Platinum, 395.

Polarization, Some Peculiarities of, and Energy Distribution by Speculum Gratings, *L. R. Ingersoll*, 491.

Polarization Capacity and Polarization Resistance as Dependent upon Frequency, *Ernest Merritt*, 524.

Pondero-motive Force, Comparison between the Fundamental Equations for the, for Point Charges due to Larmor-Lorentz and to Megh Nad Saha, *Albert C. Crehore*, 249.

Potential Gradient, Influence of the Earth's, upon the Measurement of the Atmospheric Ionic Density by the Ebert Ion Counter, *J. F. Mackell*, 390.

Proustite, The Spectrophotoelectric Sensitivity of, *W. W. Coblentz*, 245.

Pure Tones, The Binaural Location of, *R. V. L. Hartley and Thornton G. Fry*, 532.

Pyrometer Filaments, The Current-Temperature Relation for different, *W. E. Forsythe*, 267.

Q.

Quantum Rule, A Physical Interpretation of Planck's, *Albert C. Crehore*, 544.

Quantum Theory, The Balmer Series of Hydrogen and the, of Line Spectra, *Raymond T. Birge*, 589.

R.

Radiation, Reflection of, from an Infinite Series of Equally Spaced Planes, *K. W. Lamson*, 624.

Radiating Energy, The Copernican Atom, A Physical Interpretation of Planck's Quantum Rule, *Albert C. Crehore*, 544.

Radiating Potentials, Note on the, and Ionizing Potentials of Hydrogen, *K. T. Compton and P. S. Olmstead*, 45.

Ray Analysis, Positive, of Magnesium, *A. J. Dempster*, 427.

Red Heat, The Luminescence of Zinc Oxide above the Red Heat, *E. L. Nichols*, 429.

Reed Instrument, Broken Tone from, *John B. Taylor*, 534.

Reflection of X-Rays, The, from Calcite, *Bergen Davis and W. M. Stempel*, 526.

Relative Motion. Note on Electromagnetic Induction and, A Rejoinder, *W. F. G. Swann*, 242.

Relative Motion, An Experiment on Electromagnetic Induction and, *W. F. G. Swann*, 423.

Residual Ionization, The Variation of the, in Air with Pressure, *K. Melvina Downey*, 389.

Resistance, The, of a Compressible Fluid at High Velocities, *L. Thompson*, 371.

Resistance, The Electrical, of Metals, *P. W. Bridgman*, 161.

Resistance, Polarization Capacity and Polarization, as Dependent upon Frequency, *Ernest Merritt*, 524.

Resistance Standard, A High Frequency, *John G. Frayne*, 415.

Resonator, The Acoustical Double, and its Applications, *F. R. Watson*, 380.

Resonator, The Piezo-Electric, *W. G. Cady*, 531.

Richtmyer, F. K., Mass-Absorption Coefficients as a Function of Wave-Length above and below the K X-Ray Limit of the Absorber, 264.

The Evidence Regarding the So-called "J" Radiation in the Characteristic X-Ray Spectra of the Elements, 433.

Ricker, Norman H., The Luminosity of Mercury Vapor Distilled from the Arc in Vacuo, 195.

Rigidity, A Determination of Young's Modulus and of the Coefficient of Simple, of Natural Hexagonal Crystals of Selenium, *L. P. Sieg and R. F. Miller*, 411.

Rochelle Salt, Piezo-electric Activity of, under Various Conditions, *J. Valasek*, 422.

Rochelle Salt, Piezo-Electric and Allied Phenomena in, *J. Valasek*, 475.

Rock Salt, The Optical Dispersion and the Crystal Structure of, and Sylvite, *H. H. Marvin*, 412.

Rogers, F. J., Lecture Room Wall Charts, 509.

Rutherford's Theory, The Abundance of Atomic Species as Related to, of Nuclear Structure, *William D. Harkins*, 388.

S.

Sabine, Paul E., Transmission and Absorption of Sound by a Porous Material, 378.

Sabine, Paul E., Effect of Humidity on Sound Absorption by Plaster Walls, 379.

Saha, Megh Nad, Comparison between the Fundamental Equations for the Ponderomotive Force for Point Charges due to Larmor-Lorentz and to, *Albert C. Crehore*, 249.

Samarium, The Luminescence of, *Horace L. Howes*, 60.

Sanford, Fernando, The Electrostatic Charges of the Earth and Sun and their Relation to Terrestrial Magnetism, 243.

Diurnal Variations in Terrestrial Magnetism and in the Electrical Potential of the Earth, 513.

Sun Spots and Terrestrial Magnetic Storms, 515.

Scott, M., The Absorption Spectra of Ortho-Cresolsulphonphthalein, 437.

Selenium, A Determination of Young's Modulus and of the Coefficient of Simple Rigidity of Natural Hexagonal Crystals of, *L. P. Sieg and R. F. Miller*, 411.

Sensitivity, The Spectrophotoelectric, of Proustite, *W. W. Coblentz*, 245.

Sheet Striæ, Note on, as Thin Films in Optical Glass, *L. E. Dodd*, 270.

Shrader, James E., Conductivity of Insulating Materials near the Breakdown Voltage, 234.

Conductivity of Insulating Materials near the Breakdown Voltage, 491.

Sieg, L. P., A Determination of Young's Modulus and of the Coefficient of Simple Rigidity of Natural Hexagonal Crystals of Selenium, 411.

The Intensity of Light Transmitted through a Deep Slit, 413.

Silver Films, Constancy of Hall Coefficient in Thin, *G. W. Stewart*, 232.

Silver Films, The Hall Effect and the Specific Resistance in, *G. R. Wait*, 233.

Singing Tube, Note on the Characteristics of the New, *Charles T. Knipp*, 532.

Slit, The Intensity of Light Transmitted through a Deep, *L. P. Sieg and A. T. Fant*, 413.
Smith, Alpheus W., The Hall Effect and the Nernst Effect in Magnetic Alloys, 23.
The Hall Effect and the Nernst Effect in Magnetic Alloys, 233.
Smith, Alva W., The Effect of a Superposed Constant Field upon the Alternating Current Permeability and Energy Loss in Iron, 416.
Souder, William, The Thermal Expansion of Nickel, Monel Metal, Stellite and Stainless Steel, 372.
Sound Absorption, Effect of Humidity on, by Plaster Walls, *Paul E. Sabine*, 379.
Sound Energy, Minimum, for Audition, *F. W. Franz*, 384.
Sound Field, The, of a Parabolic Mirror, *E. A. Eckhardt*, 381.
Sound Field, A Method of Measuring Phase Differences in a, *J. C. Karcher*, 382.
Sound Intensity, Apparatus for Measuring, *J. C. Karcher*, 382.
Sound Producer, A Portable, of Considerable Range as to Frequency and Intensity, *E. A. Eckhardt*, 380.
Sound, Transmission and Absorption of, by a Porous Material, *Paul E. Sabine*, 378.
Sound Wave, On the Propagation of the, from the Muzzle of a Large Gun, *Dayton C. Miller*, 255.
Sound Waves, A Method of Studying, by Means of a Synchronous Commutator, *L. O. Grandahl*, 258.
Spaced Planes, Reflection of Radiation from an Infinite Series of, *K. W. Lamson*, 624.
Specific Resistance, The Hall Effect and the, in Silver Films, *G. R. Wait*, 233.
Speculum Gratings, Some Peculiarities in Energy Distribution by Speculum Gratings, *L. R. Ingersoll*, 407.
Speculum Gratings, Some Peculiarities of Polarization and Energy Distribution by, *L. R. Ingersoll*, 491.
Spectral Structure, The, of the Luminescence Excited by the Hydrogen Flame, *Horace L. Howes*, 538.
Sphere of Oil, On the Motion of a, through Carbon Dioxide and an Exact Determination of the Coefficient of Viscosity of that Gas by the Oil Drop Method, *L. J. Lasalle*, 354.
Spectra, Character of the, Produced by High Potential Sparks in a Vacuum, *Edna Carter*, 436.
Spectra. The Balmer Series of Hydrogen and the Quantum Theory of Line, *Raymond T. Birge*, 589.
Spectrum, A Continuous, from Mercury Vapor, *Clement D. Child*, 270.
Stability Conditions in Vacuum Tube Circuits, *R. D. Duncan, Jr.*, 302.
Stainless Steel, The Thermal Expansion of Nickel, Monel Metal, Stellite and, *William Souder and Peter Hidnert*, 372.
Steam, Diathermancy of Ice, Water and, *S. L. Brown*, 375.
Stellite, The Thermal Expansion of Nickel, Monel Metal, and Stainless Steel, *William Souder and Peter Hidnert*, 372.
Stempel, W. M., Reflection of X-Rays from Crystals, 521.
The Reflection of X-Rays from Calcite, 526.
An Experimental Study of the Reflection of X-Rays from Calcite, 608.
Stewart, G. W., Constancy of Hall Coefficient in Thin Silver Films, 232.
An Acoustic Wave Filter, 382.
Strontium, New, and Barium Photo-electric Cells, *Theodore W. Case*, 398.
Sun Spots and Terrestrial Magnetic Storms, *Fernando Sanford*, 515.
Surface Tension, A Method of Measuring, of Liquids, *Harry Clark*, 537.
Swann, W. F. G., A Compensation Scheme for Electrostatic Measurements, 240.
Swann, W. F. G., Note on Electromagnetic Induction and Relative Motion: A Rejoinder, 242.
An Experiment on Electromagnetic Induction and Relative Motion, 423.
Sylvite, The Optical Dispersion and the Crystal Structure of Rock Salt and, *H. H. Marvin*, 412.
Synchronous Commutator, A Method of Studying Sound Waves by Means of a, *L. O. Grondahl*, 258.

T.

Tate, John T., The Effect of Angle of Incidence on the Reflection and Secondary Emission of Slow Moving Electrons from Platinum, 394.
Taylor, John B., Broken Tone from Reed Instrument, 534.
Terrestrial Magnetism, The Electrostatic Charges of the Earth and Sun and Their Relation to, *Fernando Sanford*, 243.
Terrestrial Magnetism, Vertical Electric Currents and the Relation between, and Atmospheric Electricity, *Louis A. Bauer*, 424.
Terrestrial Magnetism, Diurnal Variations in, and in the Electrical Potential of the Earth, *Fernando Sanford*, 513.
Terrestrial Magnetic Storms, Sun Spots and, *Fernando Sanford*, 515.
Thermal Expansion, The, of Nickel, Monel Metal, Stellite and Stainless Steel, *William Souder and Peter Hidnert*, 372.
Thermionic Current, The, between Parallel Plane Electrodes; Velocities of Emis-

sion Distributed according to Maxwell's Law, *Thornton C. Fry*, 441.
Thermionic Discharges, Pulsating, in Evacuated Tungsten Lamps, *A. G. Worthing*, 237.
Thermionic Work Function, A Comparison of the, Photoelectric and, from Platinum, *Otto Koppius*, 395.
Thompson, L., The Resistance of a Compressible Fluid at High Velocities, 371.
Tube Experiments, with the Cathode Region in a Transverse Magnetic Field, 421.
Time of Exposure, The Blackening of a Photographic Plate as a Function of Intensity of Light and, *P. S. Helmick*, 411.
Tone, Broken, from Reed Instrument, *John B. Taylor*, 534.
Tone Generator, A New, *C. W. Hewlett*, 257.
Transmission and Absorption of Sound by a Porous Material, *Paul E. Sabine*, 378.
Tube Experiments, with the Cathode Region in a Transverse Magnetic Field, *L. Thompson*, 421.
Tungsten, Effect of Strong Electrostatic Fields on the Vaporization of, *A. G. Worthing and W. C. Baker*, 239.
Tungsten Lamps, Pulsating Thermionic Discharges in Evacuated, *A. G. Worthing*, 237.
Tuning Forks, Electron Tube Drive for, *E. A. Eckhardt, J. C. Karcher and M. Keiser*, 535.

U.

Ultra-Violet, The Spectrum of Helium in the Extreme, *Hugo Fricke and Theodore Lyman*, 434.
Ultra-violet Light, The Coloration of Glass by, *J. B. Nathanson*, 408.

V.

Vacuum Tube, Calculation of the Amplification Constant of the Weagant Thermionic, *Alexander Marcus*, 1.
Vacuum Tubes, The Dynamic Characteristics of Three Electrode, *John G. Frayne*, 391.
Vacuum Tube Circuits, Stability Conditions in, *R. D. Duncan, Jr.*, 302.
Valasek, J., Piezo-electric Activity of Rochelle Salt under Various Conditions, 422.
Piezo-Electric and Allied Phenomena in Rochelle Salt, 475.
Vaporization of Tungsten, Effect of Strong Electrostatic Fields on the, *A. G. Worthing and W. C. Baker*, 239.
Vaporization of Tungsten, II., Effect of Strong Electrostatic Fields on the, *A. G. Worthing*, 418.
Vertical Electric Currents and the Relation between Terrestrial Magnetism and Atmospheric Electricity, *Louis A. Bauer*, 424.

W.

Waggoner, C. W., Anhysteretic Curves of Iron-Carbon Alloys made with a Braun Tube, 427.
Wait, G. R., The Hall Effect and the Specific Resistance in Silver Films, 233.
Wall Charts, Lecture Room, *F. J. Rogers*, 509.
Washburn, Edward W., The Dynamics of Capillary Flow, 273.
The Dynamics of Capillary Flow, 374.
Water, The Mass Absorption and Mass Scattering Coefficients for Homogeneous X-Rays of Wave-Length between 0.13 and 1.05 Angstrom Units in, Lithium, Carbon, Nitrogen, Oxygen, Aluminum, and Iron, *C. W. Hewlett*, 284.
Water, Diathermancy of Ice, and Steam, *S. L. Brown*, 375.
Watson, F. R., The Acoustical Double Resonator and its Applications, 380.
Moving Pictures of Wave Motion, 381.
Wave Composition Model, A, *J. G. Brown*, 512.
Wave Filter, An Acoustic, *G. W. Stewart*, 382.
Wave Motion, Moving Pictures of, *F. R. Watson*, 381.
Weagant Thermionic Vacuum Tube, Calculation of the Amplification Constant of the, *Alexander Marcus*, 1.
Weeks, J. R., The Relation between the Emissive Power of a Metal and its Electrical Resistivity, 261.
Wick, Frances G., The Crystal Structure of Two Rare Halogen Salts, 403.
Wilber, D. T., Flame Excitation of Luminescence, 269.
Flame Excitation of Luminescence, 453.
The Luminescence of Certain Oxides sublimed in the Electric Arc, 707.
Williams, S. R., The Magnetic Mechanical Analysis of Manganese Steel, 237.
A Seasonal Breakage of the Mainsprings of Watches, 378.
Wilkins, T. R., Multiple Valency in the Ionization by Alpha Rays, 404.
Wilson, H. A., An Electromagnetic Theory of Gravitation, 54.
Worthing, A. G., Pulsating Thermionic Discharges in Evacuated Tungsten Lamps, 237.
Effect of Strong Electrostatic Fields on the Vaporization of Tungsten, 239.
Effect of Strong Electrostatic Fields on the Vaporization of Tungsten, II., 418.

X.

X-Ray Absorption Frequencies, Approximate Computations of, *William Duane*, 431.

X-Ray Analysis of Three Series of Alloys, *Mary R. Andrews*, 259.
X-Ray Crystal Analysis, The Cubic Shapes of Certain Ions, as Confirmed by, *Wheeler P. Davey*, 402.
X-Ray Crystal Analysis of Thirteen Common Metals, *Albert W. Hull*, 571.
X-Ray Data, Graphical Determination of Hexagonal and Tetragonal Crystal Structure from, *Albert W. Hull and Wheeler P. Davey*, 266.
X-Ray Data, Graphical Determination of Hexagonal and Tetragonal Crystal Structure from, *Albert W. Hull and Wheeler P. Davey*, 549.
X-Ray Diffraction Patterns, An Explanation of, from Rolled Metals, *C. T. Dozier*, 519.
X-Rays, On the Absorption of, by Chromium, Manganese and Iron, *William Duane and Hugo Fricke*, 529.
X-Rays, Reflection of, from Crystals, *W. M. Stempel*, 521.
X-Rays, The Reflection of, from Calcite, *Bergen Davis and W. M. Stempel*, 526.
X-Rays, An Experimental Study of the Reflection of, from Calcite, *Bergen Davis and W. M. Stempel*, 608.
X-Rays, Soft, of Characteristic Type, *E. H. Kurth*, 528.
X-Ray Spectra, On the Relative Positions of Lines in, *William Duane and R. A. Patterson*, 259.
X-Ray Spectra, The Evidence Regarding the So-called "J" Radiation in the Characteristic, of the Elements, *F. K. Richtmyer*, 433.
X-Rays, The Concentration of Monochromatic, by Crystal Reflection, *Elmer Dershem and C. T. Dozier*, 519.

Y.

Young's Modulus, A Determination of, and of the Coefficient of Simple Rigidity of Natural Hexagonal Crystals of Selenium, *L. P. Sieg and R. F. Miller*, 411.

Z.

Zinc Oxide, The Luminescence of, above the Red Heat, *E. L. Nichols*, 429.